

## USES OF CELLULOSE ACETATE IN THE HERBARIUM

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CELLULOSE acetate, mentioned several years ago as a base for mounting small seeds,<sup>1</sup> has been found increasingly useful in the preparation and care of mounted material. It is safe to use in the herbarium, since it lacks the highly inflammable property of cellulose nitrate. It can be procured inexpensively by boiling the emulsion from old X-ray film, or conveniently by purchase in large sheets.

*Protection of herbarium sheets in the laboratory.* Herbarium sheets that are to be used by classes may be protected from wear and breakage by being covered with a sheet of cellulose acetate. The acetate may be fastened to the sheet by stapling around the edges; the staple is less likely to break through the paper sheet if it is put through the back of the paper with the clamped ends folded over the acetate.

*Picking stylus.* The use of a stylus of cellulose acetate, to pick up small objects by static electricity, has already been noted.<sup>2</sup> It should perhaps be added that this procedure is more successful on a cold winter's day than when the humidity is high.

*Reinforcement after mounting.* A fairly stiff solution of cellulose acetate in acetone is an excellent substitute for gummed strips in reinforcing mounted material such as roots, petioles, twigs. With a needle, or dowel, or even a twig (but not a lacquered penholder or pencil) a line is dripped over the object; it will harden and adhere to paper and plant material. It will not adhere to a heavily cutinized material.

The drying time for a simple solution of acetate in acetone is but a few minutes or even seconds, rather than the 20 minutes described for the plastic mounting agent by Dr. Archer,<sup>3</sup> so it could probably not be used in the oil-can dispensers.

*Mounting delicate plants.* A very thin solution of cellulose acetate in acetone is used. Lay the plant (*Najas*, *Potamogeton*, *Callitriche*, etc.) on the sheet and apply the solution over the plant lightly with a brush. Enough will run under to fasten it, and the thin layer of acetate on plant and paper will be quite

<sup>1</sup> RHODORA 41: 367. 1939.

<sup>2</sup> RHODORA 51: 60. 1949.

<sup>3</sup> RHODORA 52: 298. 1951.



invisible when dry. Aquatics that have been floated out on paper before drying can thus be fastened down without being disturbed.

*Minor repairs.* A bottle of cellulose acetate solution kept on the working table is useful for instant repair of small breakage of herbarium specimens. The solution is best spread directly on the paper, and a leaf or flower replaced while the solution is still wet. It dries and hardens in a minute or two, and is invisible if a thin solution is used.

*Mounting small seeds or fruits.* Small objects, such as seeds of *Euphorbia* or *Juncus*, removed from their fruits, are easily secured directly to the herbarium sheet with a drop of cellulose acetate solution; an arrow or other mark on the sheet locates them for the next user.

A better method is to mount them on pieces of acetate sheet, cut perhaps 1 x 2 inches, that may be kept in packets. Seeds of orchids, for example, are scattered on the acetate sheet and touched with a drop of acetone; the mount is permanent in a few seconds. In preparation of a monograph of *Callitriche*, the writer has recently found this method invaluable for making direct comparison of fruits from different collections. An acetate strip with fruits from one collection can be placed over a fruit on another herbarium sheet, and the two compared side by side under the binocular microscope. Some special techniques described for handling of *Callitriche* fruits<sup>4</sup> may be adapted for use in other groups.

Spores of *Isoetes* are easily secured to an acetate sheet with a drop of acetone, but they are brittle and will be broken if the sheet is placed in a packet. For their protection, small pieces of acetate, about one mm. wide and 5 mm. long, are built up log-cabin style about the spores, and secured in place with a drop of acetone. Further protection is assured by putting on a roof; a piece cut the right size is put on top and secured with acetone.

A dried flower that has been softened by boiling or by soaking in a "detergent" solution can be mounted permanently by spreading it on an acetate strip; it is flushed with alcohol for dehydration, then saturated with acetone.

*Pressing delicate flowers.* Corollas of *Eichornia*, for example,

<sup>4</sup> RHODORA 53: 141. 1951.



too often appear in the herbarium as colorless blobs. Both shape and color can be preserved by pressing individual flowers on an acetate sheet. The flower may be laid on a sheet of convenient size, or the corollas may be removed and laid out flat. After ordinary pressing, a quick wash with acetone fastens the dried flower to the acetate. The writer has not tried this on *Iris* but is confident that it would produce excellent preparations.

*Millimeter scale.* Lines a millimeter apart, scratched on a piece of cellulose acetate, produce a ruler that can be laid over the object to be measured. This type of rule is especially useful when close measurements are to be made under the binocular microscope. A machinist can engrave such lines down to 0.2 mm. apart.—DEPARTMENT OF BOTANY, UNIVERSITY OF WISCONSIN.

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THE EFFECT OF FORCED AERATION ON THE LONGEVITY OF LAMINARIA<sup>1</sup>.—For some time investigators have been desirous of keeping Laminaria and other large marine algae alive in the laboratory for periods of several weeks. This desire, however, has been met with little or no success. In ordinary running sea water in the laboratory, the tissue of Laminaria and many other marine algae begins to slough off progressively within a few days. Usually after one week the plant is of no use.

The writer, while investigating epiphytism among marine algae, found it necessary to keep Laminaria alive in the laboratory for periods of several weeks. Some consideration of the problem revealed that species of Laminaria had been kept alive in the laboratory over a longer period of time by the addition of orange juice to sea water. In this report, however, it was not pointed out what elements of the orange juice were responsible for the longevity of Laminaria in the laboratory. The writer thought this method a little too expensive; therefore it was not tried.

Laminaria collected around Woods Hole, Massachusetts, is usually found attached to rocks or other substrates in areas where water is in rapid motion. As the result of this rapid motion, large amounts of gases are collected from the atmosphere. The writer felt that the difficulty in keeping Laminaria alive in the

<sup>1</sup> Paper presented at Marine Biological Laboratory, Woods Hole, Massachusetts.